

Argentine Tango Practice as a Balance Intervention for Cancer Survivors

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INTRODUCTION

Cancer survivors report that dysfunction in balance and walking causes distress and discomfort post-cancer¹. Additionally, this loss of balance is related to a higher risk of falls, which is the leading cause of injury and death for older adults including individuals with cancer².

What's the Problem? Loss of balance function due to:

- Deconditioning following cancer treatment
- Peripheral neuropathy following chemotherapy (CIPN) or lymphedema²

What's our Solution? Argentine Tango has been found to improve balance and quality of life among:

- The elderly^{3,4}
- Individuals with Parkinson Disease^{5,6}

Such interventions have yet to be studied among cancer survivors despite the relevance of quality of life and physical health within cancer survivorship⁷.

Why Dance? Dance provides an activity-based intervention in a social context, thus potentially improving physical as well as psychosocial aspects of health.

Why Argentine Tango?

- Incorporates varied, dynamic qualities of movement in basic walking patterns within a motivating, social setting.
- Improvisational movement elements that provide balance challenges in non-clinical environments.

The purpose of this study was to evaluate the use of Argentine Tango as a balance intervention among cancer survivors.



Images from Argentine Tango class, demonstrating partnered dance and dynamic tango movements. Photos by Jo McCully.

SPECIFIC AIMS

Primary aim: Evaluate feasibility of, and participant satisfaction with, intervention.

Follow-on aim: Measure the impact of participation on balance measures that correlate with fall risk (i.e., root mean square medial-lateral sway amplitude during eyes closed condition)⁸ among individuals who demonstrate balance deficits.



Images depicting Argentine Tango class community. Photos by Jo McCully.

METHODS

Subjects: This protocol was approved by The Ohio State University Institutional Review Board. 20 cancer survivors (age=62.9±9.7, 18F/2M) consented to participate and 9 partners (age=69.3±10.0, 3F/6M, of whom 4 were non-neurologically impaired).

Intervention: 20 (1-hour) sessions of Argentine Tango over 10 weeks. Lessons included quality of movement instruction, lower body balance warm up, tango-style walking, musicality lessons, footwork patterns, partnered dancing, weight shifts, movement generation exercises, and social dance improvisation. More detail about class structure is available in Table 1.

- **Data collected each class:** Attendance, satisfaction with intervention.
- **Data collected at 3 time points:** (baseline, 5 weeks, 10 weeks) Amplitude of medial-lateral sway while participants stood with eyes closed⁸ (M-L sway EC) on an instrumented platform (Bertec Corp, portable force platform, 1000hz).

Analysis: Satisfaction with intervention is reported for the entire cohort over 20 sessions. Balance data at baseline and midpoint are reported for survivors demonstrating M-L sway EC more than 2 standard deviations outside the norm (n= 4, age=67.8±13.7, 3F/1M) and age-matched healthy controls (n=4, age=70.3±9.8, 2F/2M).

Table 1: 1-Hour Cancer Survivor-Specific Argentine Tango Class Structure

Lesson Plan	Time	Music	Activities	Objectives
Upper body warm up/Name Game	5 min	None	In a circle each participant generates a movement while saying their name, the rest of the group repeats the name and movement	<ul style="list-style-type: none">○ Generating creative movement○ Teaching tango specific movement qualities (i.e. sharp and sustained time)○ Cultivating community
Lower body warm up	5 min	"Champagne Tango"	Tango-specific plie, tendu, ronde de jambe sequence to warm up muscles, balance, breathing and proper alignment	<ul style="list-style-type: none">○ Challenge/warm up use of weight, range of motion and balance in lower limbs○ Practice proper alignment for tango technique
Partnering enhancement exercise	2 min	"La Capilla Blanca"	"Tango Sway" (change of weight) in partners, pouring weight from foot to foot, followers close eyes	<ul style="list-style-type: none">○ Awareness of switching axis of body○ Shifting weight and full spine from side to side to free up foot to step forward
Music/Rhythmic training w/ Partnered walking	8 min	"El Choclo"	Partnered walking practicing moving on the beat, half-time and "hiccup step" (slow, slow, quick, quick, slow)	<ul style="list-style-type: none">○ Leading with the upper body, moving entire center of mass, and keeping heels together○ Focus on taking larger direct steps together to move in space○ Practice musicality
New Step of the Day	20 min	"El Amancer"	Introduce step of the day (i.e. "Ocho Step"), break into leader and follower footwork and upper body movement, put step together, and practice with music	<ul style="list-style-type: none">○ Enhance partnering ability○ Practice non-verbal communication○ Introduce new steps that challenge the mind and body○ Reinforce proper alignment in a new step
Review of previous steps/Final improvisation	15 min	Assorted Argentine Tango Music	Review steps learned in previous classes	<ul style="list-style-type: none">○ Practicing recall skills○ Enhancing improvisation by providing tools to remember tango steps○ Challenging musicality and quality of movement
Concluding activity	5 min	Fun Tango Music	Cool-down walk in circle, celebratory dance, turn into circle for group bow and applause	<ul style="list-style-type: none">○ Celebrating within community○ Creating a sense of accomplishment

RESULTS

- Satisfaction with intervention was high for cancer survivors (**average=1.4**, on a 1-7 scale, with 1=very satisfied, n=20) and controls (average=1.8, n=9).
- Cancer survivors improved on the measure of fall risk (Figure 1) from baseline to 5 weeks by **56%** (p<0.01; mean pre: 8.4±1.1mm, mean post: 4.7±0.5mm, n=4) achieving values comparable to controls (mean pre: 4.5±1.6mm, mean post: 3.5±0.5mm, n=4).

Figure 1: Change in Control of Lateral Stability

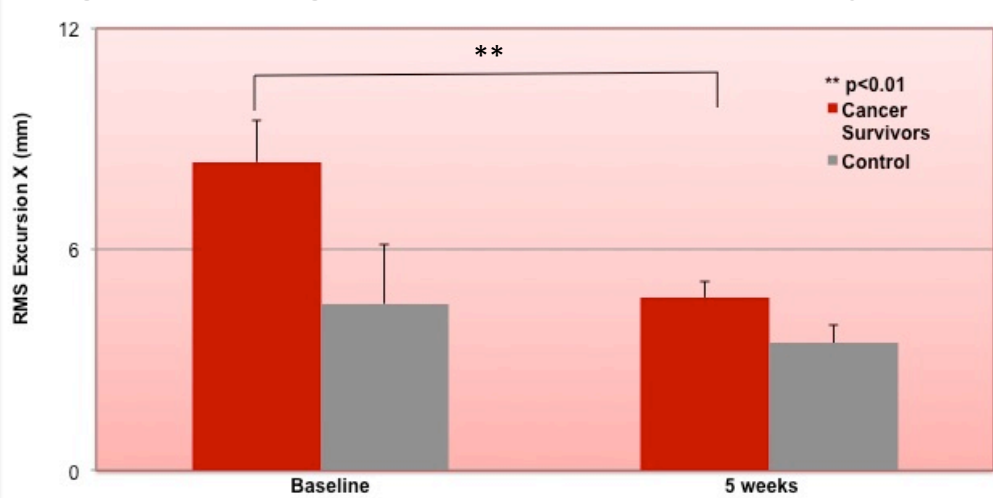


Figure 1: M-L sway EC of cancer survivors/controls, indicating an increase in cancer survivors control of lateral stability from baseline to midpoint (5-weeks) in the intervention. ** p< .01



Images from Argentine Tango class, illustrating partnered dance with complex movements that challenge balance. Photos by Jo McCully.

DISCUSSION

- This work provides the first known evidence regarding whether cancer survivors find a dance-based intervention, Argentine Tango, satisfying and feasible for balance improvement.
- Improved control of lateral stability after 5-weeks of practice indicates that Argentine Tango is a promising balance intervention for cancer survivors experiencing impaired balance post treatment.

FUTURE GOALS

- Evaluate retention data 4 weeks post intervention.
- Secure funding for a larger trial.
- Promote use of the arts, specifically dance, as a way to provide innovative and personalized care to treat the whole person and an important area of research.

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